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In the claims:

Please add new claims 22-24:

22. The process of claim 1, wherein R is a member of group (i), and said secondary metal ions are selected from the group consisting of: Li^+ , Na^+ , K^+ , Rb^+ , Cs^+ , Be^{2+} , Mg^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , B^{3+} , Al^{3+} , Al^{3+} , Ga^{3+} , In^{3+} , Tl^{3+} , Sn^{2+} , Sn^{4+} , Pb^{2+} , Sb^{4+} , Sc^{3+} , Ti^{3+} , V^{3+} , Cr^{3+} , Mn^{2+} , Fe^{2+} , Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} , Y^{3+} , Zr^{n+} , Nb^{n+} , Mo^{n+} , Tc^{n+} , Ru^{3+} , Rh^{n+} , Pd^{2+} , Ag^+ , Cd^{2+} , lanthanides, Pt^{2+} , Au^{3+} and Hg^{2+} .

23. The process of claim 22, wherein R is a member of group (i), and said secondary donors are selected from the group consisting of: O, N, S, Cl, F, Br, I, C, and P.

24. The process of claim 12, said secondary metal ion is selected from the group consisting of: Li^+ , Na^+ , K^+ , Rb^+ , Cs^+ , Be^{2+} , Mg^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , B^{3+} , Al^{3+} , Al^{3+} , Ga^{3+} , In^{3+} , Tl^{3+} , Sn^{2+} , Sn^{4+} , Pb^{2+} , Sb^{4+} , Sc^{3+} , Ti^{3+} , V^{3+} , Cr^{3+} , Mn^{2+} , Fe^{2+} , Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} , Y^{3+} , Zr^{n+} , Nb^{n+} , Mo^{n+} , Tc^{n+} , Ru^{3+} , Rh^{n+} , Pd^{2+} , Ag^+ , Cd^{2+} , lanthanides, Pt^{2+} , Au^{3+} and Hg^{2+} .

25. The process of claim 24, said secondary donor is selected from the group consisting of: O, N, S, Cl, F, Br, I, C, and P.

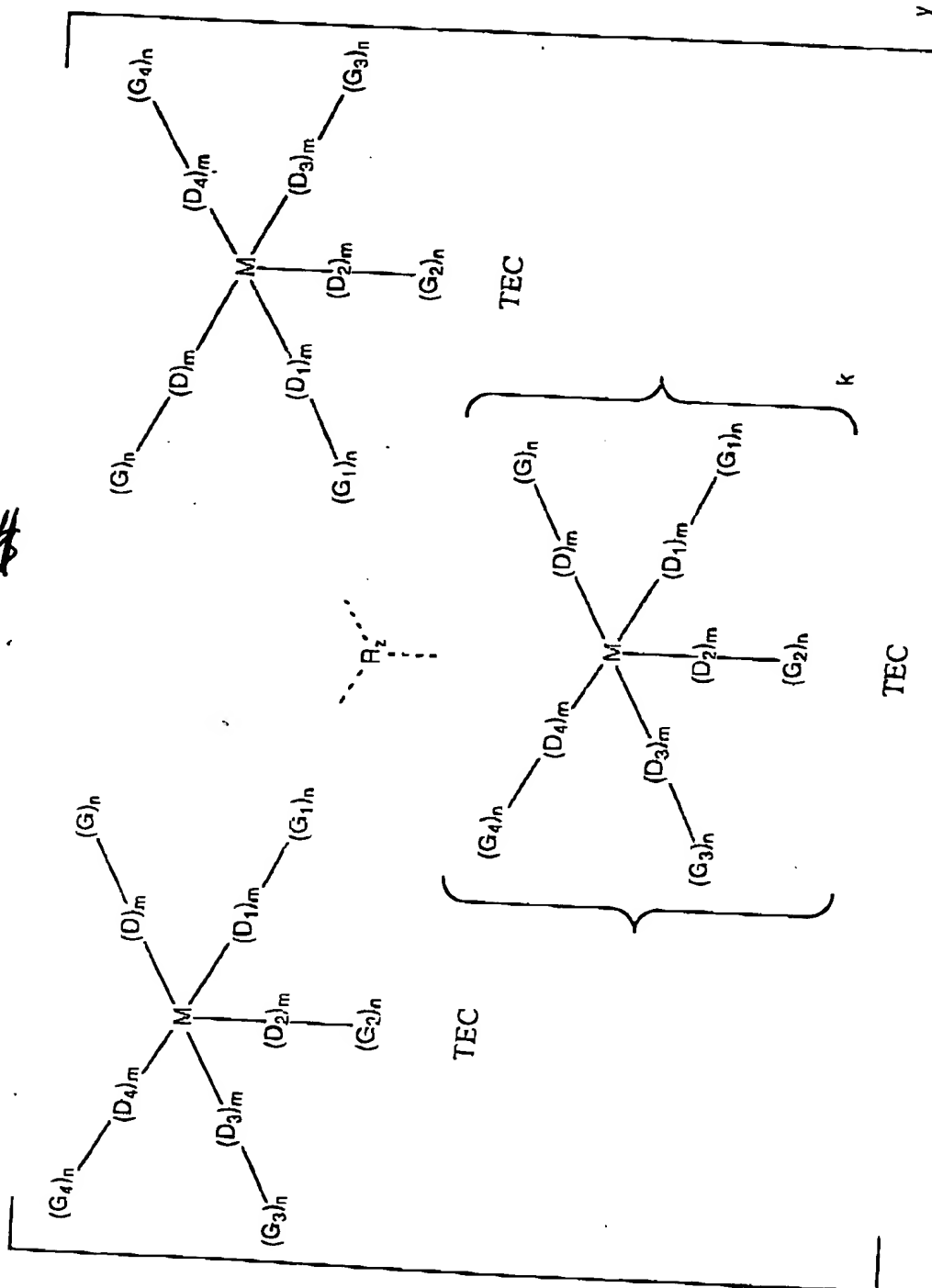
26. The process of claim 13, wherein R is a member of group (i), and said secondary metal ions are selected from the group consisting of: Li^+ , Na^+ , K^+ , Rb^+ , Cs^+ , Be^{2+} , Mg^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , B^{3+} , Al^{3+} , Al^{3+} , Ga^{3+} , In^{3+} , Tl^{3+} , Sn^{2+} , Sn^{4+} , Pb^{2+} , Sb^{4+} , Sc^{3+} , Ti^{3+} , V^{3+} , Cr^{3+} , Mn^{2+} , Fe^{2+} , Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} , Y^{3+} , Zr^{n+} , Nb^{n+} , Mo^{n+} , Tc^{n+} , Ru^{3+} , Rh^{n+} , Pd^{2+} , Ag^+ , Cd^{2+} , lanthanides, Pt^{2+} , Au^{3+} and Hg^{2+} .

27. The process of claim 26, wherein R is a member of group (i), and said secondary donors are selected from the group consisting of: O, N, S, Cl, F, Br, I, C, and P.

Please amend claims 1, 8, 12, 13, 16 and 21 as follows:

1. (Once Amended) A process for selectively adsorbing a component of a gas mixture, which comprises contacting the mixture with a solid state, selective adsorbent material comprising a porous framework of a plurality of transition element complexes (TECs) having the formula shown below:

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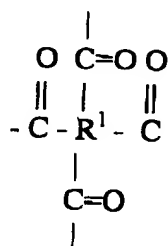
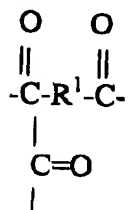
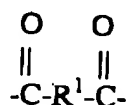
- (a) M is a primary transition metal ion;
- (b) D to D₄ are primary donors and m is zero or one, at least three of D to D₄ occupying primary donor coordination sites on M but leaving at least one open coordination site on M for the component to react with M;
- (c) G to G₄ are functional groups and n is zero or one, at least one of G to G₄ being intramolecularly bonded to at least three adjacent primary donors to form at least one 5 or 6 member chelate ring on the primary transition metal ion and providing at least three donors thereto;
- (d) M, D to D₄ and G to G₄ together define one or more transition metal complexes, wherein said complexes are the same or different and wherein k is from 0 to 4;
- (e) R is an intermolecular connecting group selected from
- (i) secondary metal ions coordinated with secondary donors bonded to one or more of groups G to G₄ on the respective TECs;
 - (ii) multifunctional organic groups forming covalent bonds with one or more of groups G to G₄ on the respective TECs;
- or
- (iii) non-coordinating counter-ions spaced between and separating the respective TECs;

wherein z is from 1 to 8, and wherein R may be the same or different when z is greater than 1; and

- (f) y is an integer sufficient to provide said porous framework of the plurality of TECs for the selective adsorption of the desired component thereon.

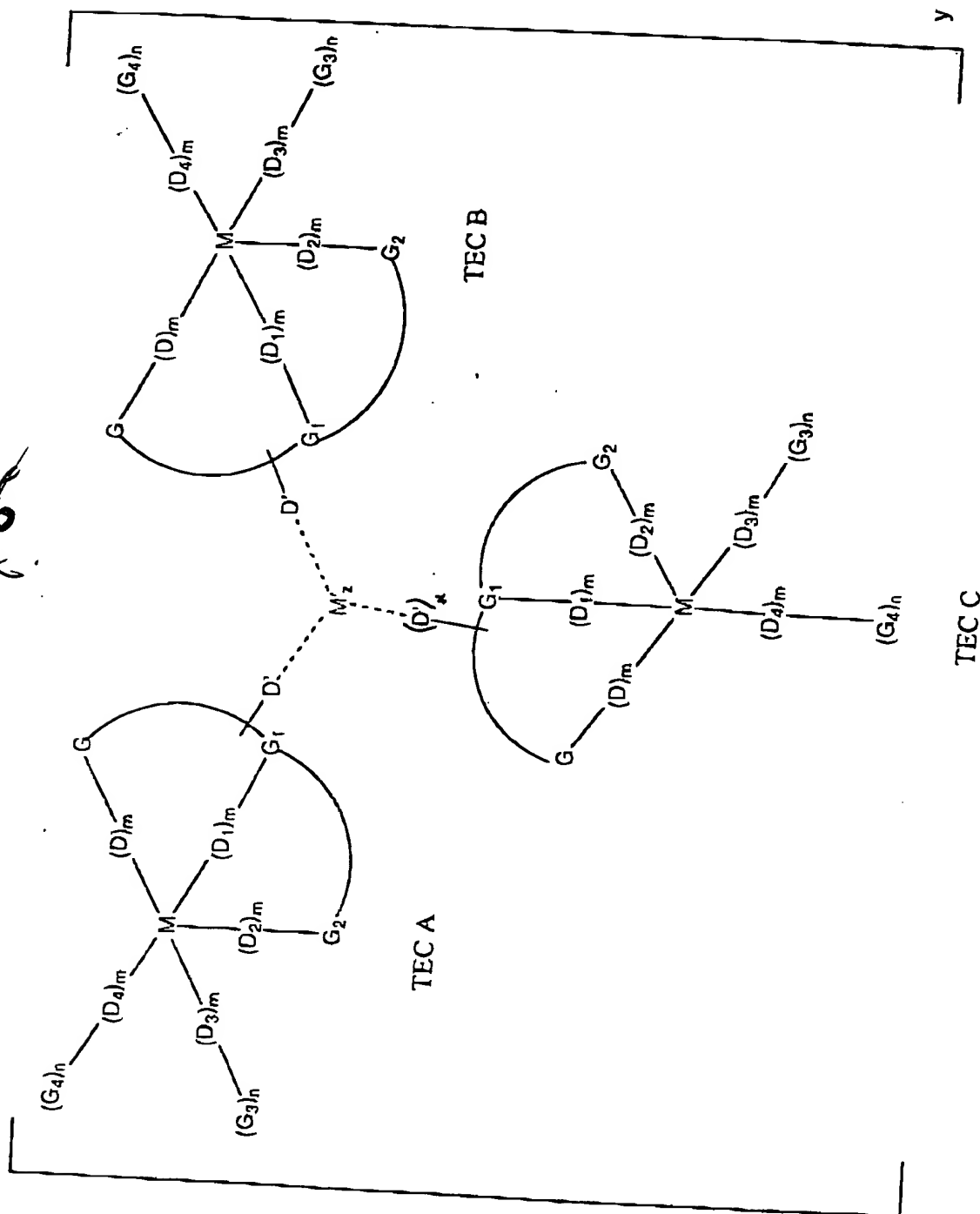
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8. (Once amended) The process of claim 1 for selectively adsorbing a component of a gas mixture, wherein R is a member of group (ii) and has the formula



or mixtures thereof, and wherein R¹ is a substituted or unsubstituted acyclic or carbocyclic group and is unsubstituted or is substituted by F, Cl, Br, O, N, P, S, Si or B.

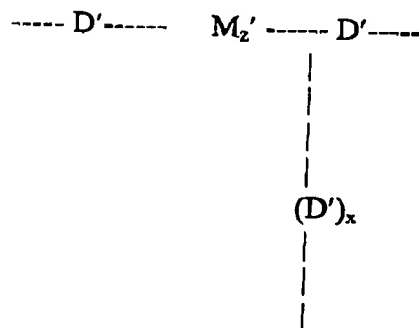
12. (Once amended) A process for selectively adsorbing oxygen from a gas mixture, which comprises contacting the mixture with a solid state, selective adsorbent material comprising a porous framework of a plurality of transition element complexes (TECs) having the formula shown below,

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wherein:

- (a) M is a primary transition metal ion selected from Co(II), Fe(II) or Mn(II);
- (b) D to D₄ are primary donors occupying primary donor coordination sites on M but leaving one open coordination site on M for an oxygen molecule to react with M;
- (c) G to G₄ are functional groups and n is zero or one, at least one of G to G₄ being intramolecularly bonded to at least three adjacent primary donors to form at least one 5 or 6 member chelate ring on the primary transition metal ion and providing at least three donors thereto;
- (d) M, D to D₄ and G to G₄ together define one or more transition metal complexes TEC A, TEC B and TEC C, wherein said complexes are the same or different;
- (e) D' is a secondary donor or a group of secondary donors bonded to a chelate ring on a coordination site on M, ;
- (f) M' is a secondary metal ion coordinated with secondary donors D',

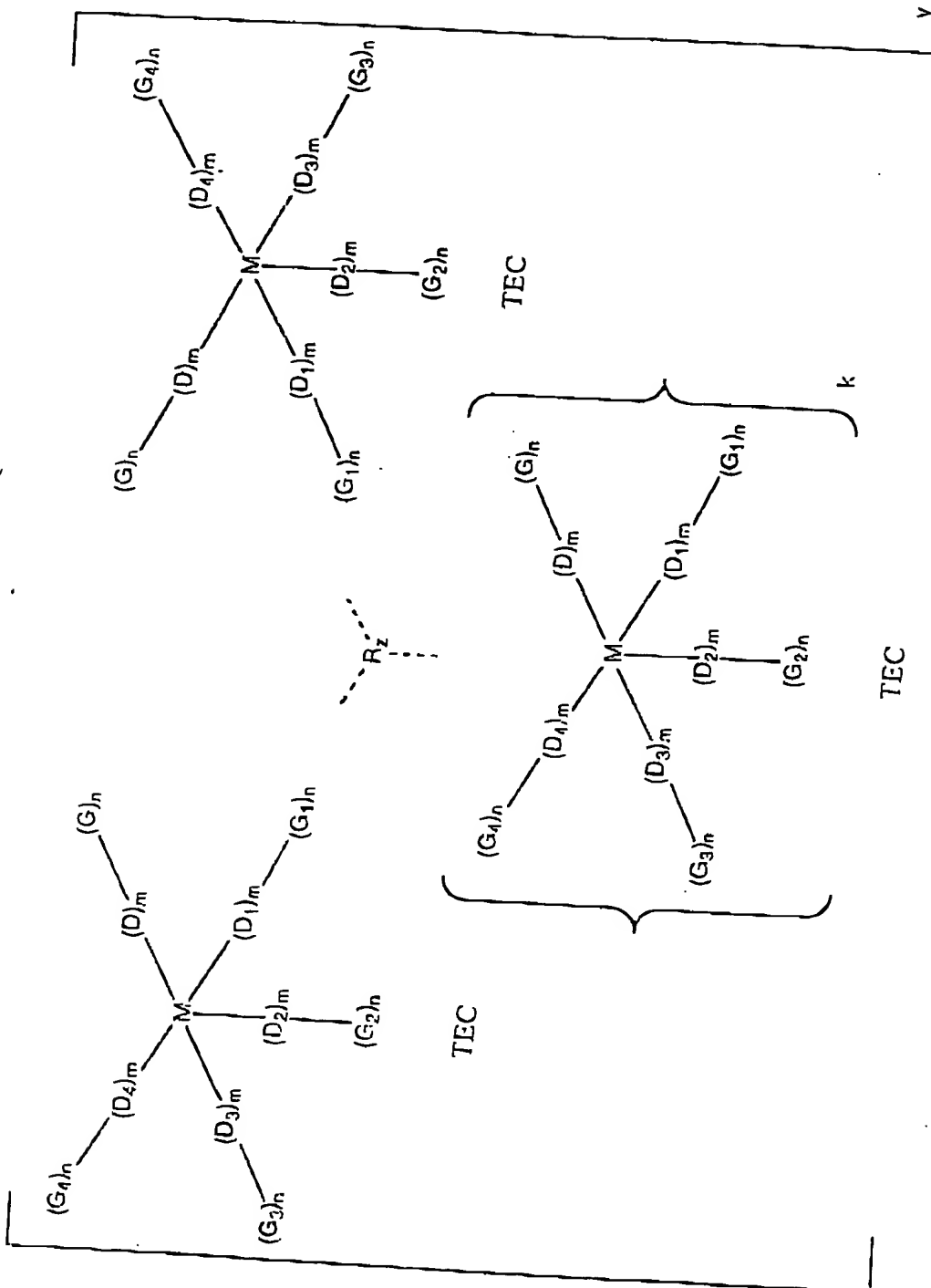


the group bonding the respective TECs to one another to maintain them in a porous framework and wherein z is from 1 to 8 and x is from 0 to 6; and

(g) y is an integer sufficient to provide said porous framework of the plurality of TECs for the selective adsorption of oxygen thereon.

13. (Once amended) A composition for selectively adsorbing a component of a gas mixture, which comprises a solid state, selective adsorbent material comprising a porous framework of a plurality of transition element complexes (TECs) having the formula shown below,

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wherein:

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cont.
- (a) M is a primary transition metal ion;
 - (b) D to D₄ are primary donors and m is zero or one, at least three of D to D₄ occupying primary donor coordination sites on M but leaving at least one open coordination site on M for the component to react with M;
 - (c) G to G₄ are functional groups and n is zero or one, at least one of G to G₄ being intramolecularly bonded to at least three adjacent primary donors to form at least one 5 or 6 member chelate ring on the primary transition metal ion and providing at least three donors thereto;
 - (d) M, D to D₄ and G to G₄ together define one or more transition metal complexes, wherein said complexes are the same or different and k is from 0 to 4;
 - (e) R is an intermolecular connecting group selected from
 - (i) secondary metal ions coordinated with secondary donors bonded to one or more of groups G to G₄ on the respective TECs;
 - (ii) multifunctional organic groups forming covalent bonds with one or more of groups G to G₄ on the respective TECs;
 - (or
 - (iii) non-coordinating counter-ions spaced between and separating the respective TECs;

wherein z is from 1 to 8, and wherein R may be the same or different when z is greater than 1; and

- (f) y is an integer sufficient to provide said porous framework of the plurality of TECs for the selective adsorption of the desired component thereon.

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16. (Once amended) The composition of claim 13 for selectively adsorbing a component of a gas mixture, wherein R is a member of group (ii) and has the formula

